

Novel planar electromagnetic sensors for detection of nitrates and contamination in natural water source

Abstract:

This paper introduces novel sensors based on the combination of planar meander and interdigital electromagnetic sensors for monitoring the level of contamination in water sources. A series of experiments was conducted to determine the sensors characteristics. Two nitrates forms, namely sodium nitrates and ammonium nitrates, were mixed in several different ratios dissolved in 1 L of distilled water and were used to observe the response of the sensors. Initial results show that the sensors can detect very well the presence of nitrate added in distilled water. Furthermore, the contamination level of water samples which were taken from various sources and locations in New Zealand have been determined using the sensor, and the results was compared with the results obtained using nuclear magnetic resonance (NMR) technique. The outcomes show a very good correlation of contamination level with the output response of the sensor. The work and improvement for future consideration are discussed in this paper.